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OLIN - NORTH LITTLE ROCK SITE
ENDANGERMENT ASSESSMENT
NORTH LITTLE ROCK, ARKANSAS

SITE SAMPLING AND ANALYSIS PLAN

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OLIN CORPORATION
NORTH LITTLE ROCK, ARKANSAS

SAMPLING AND ANALYSIS PLAN

INTRODUCTION

GCA/Technology Division is preparing an Endangerment Assessment for the Olin Corporation site in North Little Rock, Arkansas under the Technical Support for Enforcement at Hazardous Waste Sites Contract with the U.S. EPA Office of Waste Programs Enforcement. Critical parameters in this assessment include:

- contaminants present and their concentrations
- apparent migration pathways
- environmental fate of contaminants
- exposure evaluation
- toxicity evaluation
- impact evaluation
- quantitative risk and exposure assessment

For this site, existing data for review included a Site Assessment and Closure Plan prepared by Olin Corporation, EPA FIT Site Inspection Report, EPA FIT memorandum reviewing the Closure Plan, a CDC Public Health Advisor's review of site information, and a letter discussing an Arkansas Department of Health water well survey around the site. In November 1983, two GCA personnel visited the site and met with local and regional personnel to obtain additional information on the site. Data collected during this visit included historical and recent aerial photographs, geologic and topographic maps of the area and regional climatological data.

Review and discussion have indicated that data are insufficient in several areas. An equally important development is the resolute implementation by Olin Corporation of the site Closure Plan they designed. The two most pertinent aspects of site closure affecting this endangerment assessment preparation are: 1) the clay capping of the approximately 5-acre burial pit area in the northern half of the site prior to GCA's site visit of November 16, 1983, and 2) the imminent installation of 12 additional monitoring wells both up and down gradient from the capped burial pit area. The following sampling activities are suggested by the available data as necessary to adequately understand the potential for, and extent and nature of, contaminants and their migration from the site.

SAMPLING PROGRAM

Ultimately, additional sampling of the Olin site will be performed by the EPA FIT contractor, Ecology & Environment, Inc. GCA realizes the logistic and financial constraints under which EPA and the FIT operates and as a result, prioritizing of the following sampling and analytical activities may be in order.

Subsurface Soil Sampling

1. The upcoming well installation by Olin Corporation provides an excellent opportunity to obtain subsurface penetration samples immediately up and down gradient from the burial pit area. This sampling will assist in the determination of the extent of subsurface contamination both on and off the site.

Preliminary information indicates that ten downgradient wells will be installed along an east-west line through the middle of the site. Because the degree of contamination of the underlying aquifer is of primary concern, the collection of penetration samples from the No. 2 and No. 4 downgradient wells (numbering west to east) and one upgradient well (background) is recommended*. Standard penetration samples (18 inch split spoon) should be collected as follows: one at the surface; one every five feet in the sand (7-12 ft. below site grade) for a depth of 30 ft; one every

*Wells are to be installed in two-well clusters so it is advised that sampling proceed in the deeper well of the No. 2 and No. 4 two-well clusters.

10 feet from this depth (37-42 ft. below site grade) to the end of boring (approximately 75 ft. below site grade). This gives a total of 10 samples per well x 3 wells = 30 samples.

2. No analytical data were found for actual burial pit material. The estimated 100 tons of pesticide waste have been only qualitatively characterized in the Olin Site Assessment as pesticides that were formulated at the site, and some highly contaminated core and dirt samples. In order to fully assess endangerment potential of the site, it is a clear priority to locate the pits and characterize the materials buried in them. It is, therefore, GCA's recommendation that geophysical methods be employed (resistivity and/or ground-penetrating radar) to determine the locations of the burial pits. Once located, a minimum of three pits should be sampled as follows: three samples from each pit at two-foot intervals to a depth of six feet. This gives a total of nine samples. Sampling will start at the pre-cap grade of the site.

Sediment & Surface Soil Sampling

1. Three sets of soil samples were collected by Olin. They are referred to as surface material, dirt samples (1-4 inches below grade) and core samples (6-12 inches below grade). Although the dirt and core samples results were quantitated, the surface sample pesticide analyses results were only qualitatively (Y/N) from areas outside of the now capped burial area indicated soil contamination. Also C-13 collected in an on-site drainage ditch south of the burial area indicated pesticide accumulation, which when the direction of drainage from the site is considered would have most likely originated from the uncapped area of the site.

In order to assess adequately the extent of further surface contamination, collection of additional surface soil samples (composite of top 12 inches) from other areas of the Olin site is recommended. As Olin intends to sell the uncapped areas, it is important to investigate more fully several sites where contamination might be expected. These sites are referenced on the attached site map. They include: 1) toxaphene drum storage area (unless data are obtained from Olin), 2) the recently graded central area near tree (former pest. formulation building), 3) in front of the former fertilizer building, 4) the back water area on the northwest border of the site, for a total of four samples.

2. In addition to the surface soil samples referred to above, further sampling of the runoff drainage ditches offsite is required. All prior activities concentrated on characterizing areas within Olin's property boundary, therefore, transport of contaminants offsite via drainage has not been adequately investigated. Returning to the attached map, sediment samples should be collected at the five designated locations along the current drainage ditch network. The Olin property manager, Mr. Riley Odams, indicated that in the past

the surface drainage flowed just about opposite to that of the present, to the southeast corner rather than to the northwest. Prior activities by the FIT contractor collected one soil sample in the southeast corner (FIT soil sample No. 5) indicating small amounts (<0.5 ppm each) of BHC and DDT present, but no gross contamination. Collection of at least one additional sample 1a (composite of top 12 in.) in this area, or perhaps at the east side of a culvert under the railroad tracks, is necessary to corroborate these results.

Groundwater Sampling

Resolution of two unclear aspects of the groundwater will also require collection of additional groundwater samples. The nature and extent of the contaminant plume, as put forth in the Olin Site Closure Plan, is dubious and based on onsite well data only. Olin hypothesized that the high pesticide concentrations in the January 1982 samples were a result of contamination during drilling for well installation. Although this is a possible explanation, it is considered questionable. Resampling several of the existing "E"-series well, two downgradient wells on Lincoln St., one of the process wells, and sampling of the 12 monitor wells proposed in the Closure Plan will clarify this situation. Also, no comprehensive water table depth measurements have been made since August 1982.

The recent grading and modification of the site necessitates the collection of these data. It is important to verify whether the water table contacts any of the overlying clay in the burial pit area. Analysis of the 12 to 14 foot core from well E-2 (which shows significant contamination), and the well log (which shows the water table depth at 14 feet), indicates that with seasonal water table fluctuations, contact between contaminated material and the water table may occur.

1. The site closure plan proposes sampling six deep and six shallow monitor wells yet to be installed. Sampling is to be conducted initially after installation, at three months, at nine months, and then annually. This plan is consistent with GCA's needs in providing information for the endangerment assessment. If possible, samples collected by Olin should be split with EPA for independent analysis. As well, water table elevations should be reported by Olin along with the results of analysis.

2. The existing wells include nine "E"-series wells, two "P"-series wells remaining, and two downgradient wells located on Lincoln Street. Concurrent with the sampling of the 12 new wells, it is necessary to also sample E1, E2, E3, E5, E7, at least one of the deep process water wells and both downgradient wells on Lincoln Street. Analytical results in conjunction with water table elevation measurements will enable a more comprehensive plume determination.

Surface Water Sampling

1. Due to the grading associated with clay cap placement, most areas of standing water onsite have apparently been eliminated. The exception may be the low area in the southeast corner of the site. This area does not appear to be grossly contaminated, however, if there is pooled water during the implementation of this Sampling and Analysis Plan, it should be sampled.
2. Visual inspection of the drainage ditch network revealed oily sheens and evidence of gross contamination at several points along the course from the site to the Arkansas River. Although contribution of runoff from many of Olin's neighbors appears to be of some significance, determination of the level of contamination in this stream is still necessary. The information currently available indicates that: (1) Olin was the only pesticide manufacturer in this area, (2) this stream was, and is, the major route of surface contamination migration from the site, (3) sediments collected in the ditch just prior to leaving Olin property showed significant pesticide contamination, and (4) this stream empties directly into the Arkansas River. It is, therefore, recommended that water samples be taken at the same five locations designated for collection of sediment samples (see attached map).

Ambient Air Sampling

Olin makes reference to ambient air monitoring data collected immediately downwind from the site(s) of greatest surficial pesticide contamination, but has not as yet documented this with submittal of data or sampling and analytical methodology. The recent capping of the burial pit area minimizes the possibility of significant airborne migration of pesticides, however, generation of new data or validation of previously referred to results is necessary for adequate assessment of endangerment.

ANALYSIS PROGRAM

In summary, a small scale, yet comprehensive, multimedia sampling program has just been presented. Reference to sampling methodology, analytical parameters, and analytical methods was purposely withheld from prior sections for purposes of clarity. The suggested analytical parameters are presented below in Table 1. However, since the FIT contractor and the EPA contract laboratory are intimately familiar with current methodologies and operate within extensive QA/QC plans, selection and documentation of appropriate methodology is left to these contractors.

TABLE 1. ANALYTICAL PROGRAM

Sample media	No. of samples	Analysis
<u>Subsurface soils</u>		
Three new Olin deep wells	30 (10 per well)	Pesticides ^a Metals ^b Base/neutral extractable ^c
Burial pit material	9	Pesticides ^a Metals ^b Base/neutral extractable ^c VOC ^d
<u>Surface soil and sediments</u>		
Uncapped surface sites	4	Pesticides ^a Metals ^b
Drainage ditch sediments	5	Pesticides ^a Metals ^b Base/neutral extractable ^c
<u>Groundwater</u>		
12 new Olin wells	12 ^e	Pesticides ^a Metals ^f TOC TOX Specific conductance pH
Existing wells ^g	8	Pesticides TOC TOX Specific conductance pH

(continued)

TABLE 1 (continued)

Sample media	No. of samples	Analysis
<u>Surface water</u>		
Standing water	1	Pesticides Base/neutral extractable Arsenic pH
Offsite stream	5	Pesticides Metals Base/neutral extractable VOCs pH
<u>Ambient air</u>		
	4 ^h	Pesticides Metals

^aEPA Method 608 or additional analysis of base/neutral extract, should include at least all BHC isomers, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, dieldrin, toxaphene.

^bPriority pollutant metals, should include at least arsenic, chromium, lead, and zinc.

^cEPA Method 625

^dEPA Method 624

^eSamples should be splits from Olin's sampling program.

^fMetals analysis should at least be done on the two western most downgradient well samples.

^gExisting wells include E1, E2, E3, E5, E7, two Lincoln Street wells, and one onsite production well.

^hOne upwind, one onsite, two downwind locations.

KEY

△: SURFACE SOIL SAMPLE

⊙ = OFFSITE DRAINAGE DITCH SAMPLE

☐ = STANDING SURFACE WATER SAMPLE

↑ = DRAINAGE DITCH

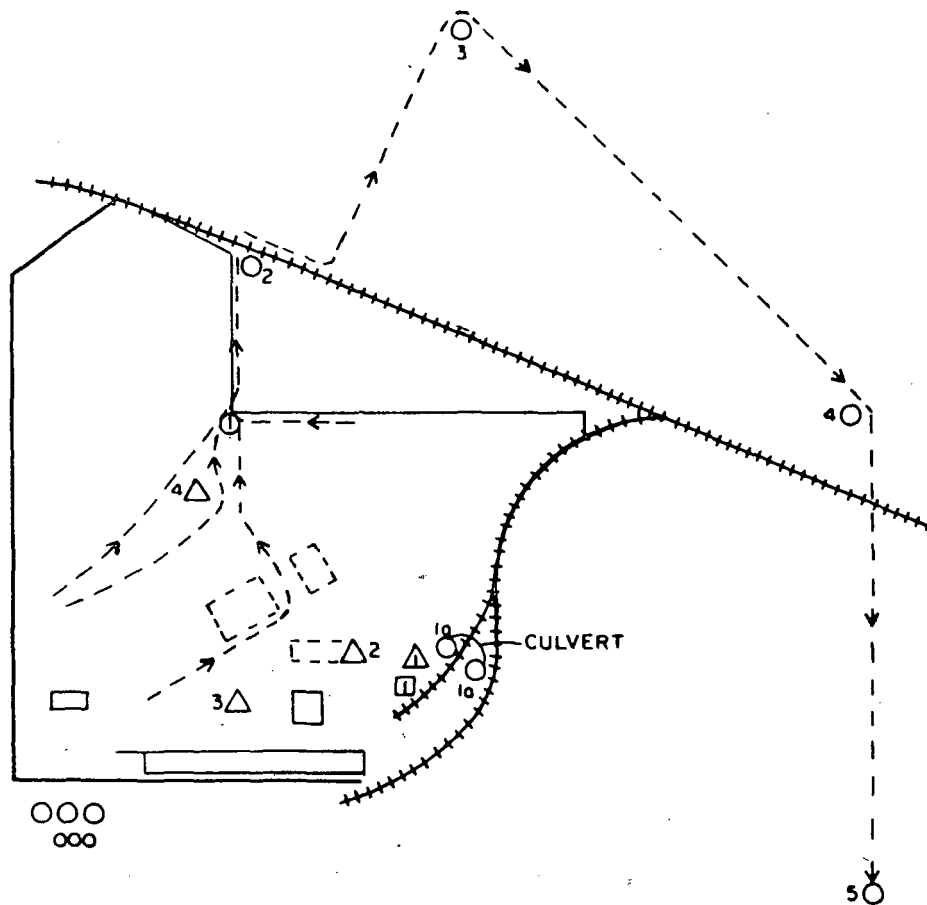


Figure 1. Site map.